

Title (en)

In situ grown gate dielectric and field plate dielectric

Title (de)

In-situ-gewachsenes Gate-Dielektrikum und Feldplatten-Dielektrikum

Title (fr)

Croissance in situ de diélectrique de grille et diélectrique de plaque de champ

Publication

EP 2605283 A2 20130619 (EN)

Application

EP 12193675 A 20121121

Priority

US 201113323672 A 20111212

Abstract (en)

Methods and apparatuses are disclosed for providing heterostructure field effect transistors (HFETs) with high-quality gate dielectric and field plate dielectric. The gate dielectric and field plate dielectric are in situ deposited on a semiconductor surface. The location of the gate electrode may be defined by etching a first pattern in the field plate dielectric and using the gate dielectric as an etch-stop. Alternatively, an additional etch-stop layer may be in situ deposited between the gate dielectric and the field plate dielectric. After etching the first pattern, a conductive material may be deposited and patterned to define the gate electrode. Source and drain electrodes that electrically contact the semiconductor surface are formed on opposite sides of the gate electrode.

IPC 8 full level

H01L 29/778 (2006.01); **H01L 21/28** (2006.01); **H01L 21/336** (2006.01); **H01L 29/20** (2006.01); **H01L 29/423** (2006.01); **H01L 29/51** (2006.01)

CPC (source: EP US)

H01L 21/0217 (2013.01 - EP US); **H01L 21/02178** (2013.01 - EP US); **H01L 21/02181** (2013.01 - EP US); **H01L 21/0228** (2013.01 - EP US); **H01L 21/28264** (2013.01 - EP US); **H01L 29/513** (2013.01 - EP US); **H01L 29/66431** (2013.01 - US); **H01L 29/66462** (2013.01 - EP US); **H01L 29/7786** (2013.01 - EP US); **H01L 29/2003** (2013.01 - EP US); **H01L 29/42376** (2013.01 - EP US); **H01L 29/517** (2013.01 - EP US); **H01L 29/518** (2013.01 - EP US)

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)

BA ME

DOCDB simple family (publication)

EP 2605283 A2 20130619; **EP 2605283 A3 20140618**; CN 103165445 A 20130619; JP 2013140956 A 20130718; TW 201342606 A 20131016; US 2013146943 A1 20130613; US 2013330888 A1 20131212

DOCDB simple family (application)

EP 12193675 A 20121121; CN 201210537477 A 20121212; JP 2012270217 A 20121211; TW 101146512 A 20121211; US 201113323672 A 20111212; US 201313963923 A 20130809